

Instrumentation for Air Monitoring and Sampling

ASPECT:

The U.S. EPA Airborne Spectral Photometric Environmental Collection Technology (ASPECT) is an airborne platform equipped with special chemical and radiological sensors and imagery technologies. It detects chemicals while collecting aerial photos and videos for situational awareness during an incident. Critical information is processed in the aircraft and transmitted to a team of scientists who evaluate it before delivering it to decision makers. ASPECT serves as an initial screening tool to help the field responders make more informed decisions based on actual measurements. ASPECT does not fly through the hazard. All the information is collected from a safe distance away from the hazard using remote sensing technologies. For the Hurricane Harvey response, ASPECT leveraged its Fourier transform infrared spectrometer (FTIR) to identify and screen chemicals, an infrared line scanner to image and map chemical plumes, while georectifying the data onto aerial imagery.

Hand-Held Real-Time Air Monitoring:

EPA is monitoring near the ITC facility as well as in the community using MultiRAE portable multi-gas monitors. These monitors provide real-time concentrations of selected gases including hydrogen sulfide, carbon monoxide, and oxygen. Additionally, volatile organic compounds such as naphtha, benzene, xylenes, and toluene are monitored. The MultiRAE also captures the instantaneous lower explosive limit and particulate concentrations. The monitors are logging and uploading data for use by decision makers.

TAGA:

The Trace Atmospheric Gas Analyzer (TAGA) is a self-contained mobile laboratory capable of real-time sampling and of outdoor air or emissions. The instrumentation refers both to the analytical instrument and the mobile laboratory built around it.

The instrumentation aboard a TAGA mobile laboratory includes:

- A TAGA mass spectrometer/mass spectrometer (MS/MS), which provides real-time monitoring for many organic and inorganic compounds at the part-per-billion by volume (ppbv) levels or lower
- A Gas Chromatograph/Mass Spectrometer (GC/MS), which analyzes volatile organic compounds at the ppbv level or lower in air samples collected in Tedlar® bags using a loop injection system
- An Agilent Micro GC, which assays permanent gases at part-per-million by volume (ppmv) levels
- A global positioning system (GPS), which supplies accurate, real-time positional data during mobile monitoring or stationary events
- A GIS system, which maps and presents the TAGA's position in real time.